

REMARKS

Reconsideration and further examination of this application is hereby requested. Claims 1 and 3-21 are currently pending in the application. Claim 2 has been canceled and its limitations incorporated into claim 1 by amendment.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached pages are captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE".

The specification has been amended to include a claim to domestic priority under 35 U.S.C. § 119(e). Applicant respectfully requests that the Examiner acknowledge the claim to domestic priority in the next paper.

A. Rejection of Claims 15-20

Claims 15-18 and 20 have been rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Gieser, Jr. *et al.* (U.S.P. 2,941,064). Claim 19 (which depends from claim 15) has been rejected under 35 U.S.C. § 103(a) as being obvious over Gieser, Jr. *et al.* alone. These rejections are respectfully traversed based on the following arguments.

In order for a claim to be anticipated, each and every limitation of the claim must be disclosed (explicitly,

implicitly, or inherently) within a single prior art reference.
That is the law.

Independent claim 15 recites a hollow metal article that has "a diffusion bond between the pair of opposed flanges, formed across the entire bond region." See the last two lines of claim 15. It is questionable whether any part of the bonding taught by Gieser, Jr. et al. may be considered diffusion bonding. The written description of Gieser, Jr. et al. consistently refers to welding, which (as is well understood by those working in the metallurgy art) is a distinct process from diffusion bonding.

Assuming for purposes of argument that some portion of the bond formed by the Gieser, Jr. et al. process would be a diffusion bond (which Applicant denies), such diffusion bond would be formed across, at most, only a portion of the bond region between the flanges, not the entire bond region as is required by the explicit language of claim 15. The remainder of the bond region is bonded via an electrical current heat weld that melts the aluminum liner. See the Gieser, Jr. et al. disclosure at col. 3, lines 68 to 75. The fact that melting occurs (implying total dissociation of atomic bonds) clearly means that some portion of the joining in the bond region of Gieser, Jr. et al. falls outside the definition of a diffusion

bond. By definition, diffusion bonding avoids melting of the materials being joined. The way the bond is formed makes a salient difference in the physical properties of the resulting article of manufacture.

In the event the Examiner may possibly consider this distinction to have been an obvious modification, Applicant presents the following explanation as to why such a modification of the prior art would not have been obvious.

It would not have been obvious to modify the bonding technique of Gieser, Jr. *et al.* to form a diffusion bond across the entire bond region because Gieser, Jr. *et al.* expressly teaches against broad application of force and focuses on the narrow application of force in only a portion of the bonding region as being a critical feature of their invention's technique. See Gieser at col. 3, lines 48 to 60. Force application is an essential aspect of diffusion bonding and the prior art clearly teaches the omission of force application for at least portion of the intended bond region. Such a teaching away by the prior art from making the hypothetical modification cannot be ignored and must be taken into account in any obviousness analysis.

For the above reasons, Applicant respectfully requests that

the Examiner carefully reconsider and withdraw the anticipation rejection of claims 15-18 and 20 and the obviousness rejection of claim 19.

B. The Obviousness Rejection

Claims 1-14 and 21 have been rejected under 35 U.S.C. § 103(a) as being obvious over Gieser, Jr. *et al.* alone. Claim 2 has been canceled and its limitations incorporated into the independent claim 1. This rejection is respectfully traversed based on the following arguments.

B.1. Claims 1 and 3-6

Independent method claim 1 (as amended) recites the limitation that "the compression force is applied broadly across the flanges so as to cover at least the bond region." See the last three lines.

The force applied by the wheels in Gieser, Jr. *et al.* is not applied broadly across the flanges so as to cover at least the bond region. Gieser, Jr. *et al.* teaches applying compression force only across a relatively narrow portion of the bond region between the flanges.

Furthermore, it would not have been obvious to modify the bonding technique of Gieser, Jr. *et al.* to apply force across a broader region because Gieser, Jr. *et al.* expressly teaches

against broad application of force and focuses on the narrow application of force as being a critical feature of their invention's technique. See Gieser at col. 3, lines 48 to 60. Such a teaching away by the prior art from making the proposed modification cannot be ignored and must be taken into account in any obviousness analysis.

For the above reasons, Applicant respectfully requests that the Examiner carefully reconsider and withdraw the obviousness rejection of claims 1 and 3-6.

B.2. Claims 7-14 and 21

Independent claim 7 is directed to a bond joint and recites "a diffusion bond between the pair of opposed flanges, formed across the entire bond region." See the last two lines. Independent bond joint claim 21 is also directed to a bond joint and recites a similar limitation. See lines 6-7.

Gieser, Jr. et al. does not disclose its bond joint as having a diffusion bond between the pair of opposed flanges, formed across the entire bond region. As discussed above concerning claim 15, it is questionable whether any part of the bonding taught by Gieser, Jr. et al. would meet the definition of diffusion bonding. However, even if the disclosure of Gieser, Jr. et al. were interpreted in the light most favorable to the

Examiner's position (an interpretation that Applicant does not concede), it is clear that the bonding technique taught would form a diffusion bond at most only across a portion of the bond region between the flanges, not the entire bond region. The remainder of the bond region is bonded via an electrical current heat weld that melts the aluminum liner. The fact that melting occurs (implying total dissociation of atomic bonds) clearly means that some portion of the welding in the bond region of Gieser, Jr. et al. falls outside the definition of diffusion bonding.

As was also discussed above, it would not have been obvious to modify the bonding technique of Gieser, Jr. et al. to form a diffusion bond across the entire bond region because Gieser, Jr. et al. expressly teaches against broad application of force and focuses, rather, on the narrow application of force in only a portion of the bonding region as being a critical feature of their invention's technique. See Gieser at col. 3, lines 48 to 60.

For the above reasons, Applicant respectfully submits that the Examiner has failed to make a *prima facie* case of obviousness with respect to claims 7-14 and 21.

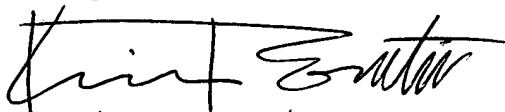
C. Conclusion

In view of the above, Applicant respectfully submits that independent claims 1, 7, 15, and 21 are patentable over the prior art. Applicant further submits that dependent claims 3-6, 8-14, and 16-20 are patentable at least as being dependent from patentable independent claims, and are further patentable due to the additional limitations recited therein.

For the above reasons, Applicant respectfully submits that the application is in condition for allowance with claims 1 and 3-21. If there remain any issues that may be disposed of via a telephonic interview, the Examiner is kindly invited to contact the undersigned at the local exchange given below.

The Commissioner is authorized to charge any necessary fees, and conversely, deposit any credit balance, to Deposit Account No. 18-1579.

Respectfully submitted,


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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claim 2 has been canceled.

Claim 1 has been amended as follows:

1. (Amended) Method of bonding metal shells to form a vessel having an interior void, the method comprising:

forming each of the metal shells with a peripheral flange;

aligning the metal shells with one another such that their respective peripheral flanges are engaged with one another;

assembling the aligned metal shells with tooling to engage the flanges; and

applying compression force to the flanges, via the tooling, at an elevated temperature so as to form a diffusion bond joint where the flanges meet;

wherein the region where the flanges engage one another defines a bond region, and wherein the compression force is applied broadly across the flanges so as to cover at least the bond region.